

7. a) What is the principle of filtration? Derive the equation for constant rate and constant pressure filtration. 7
- b) Explain in detail construction and working of rotary drum filter. State its advantages and disadvantages. 7

OR

8. a) Compare in detail the pressure filter with vacuum filter. 7
- b) Explain the construction and working of plate and frame filter press in detail with the help of neat diagram. 7
9. a) Discuss the construction, working and calculation of magnitude, pressure and stress developed in centrifuge. 8
- b) Explain the construction and working of cyclone separator. 5

OR

10. a) Explain the principle of scrubber. 5
- b) A centrifuge with a phosphor-bronze basket 375mm diameter is to be run at 30Hz with a 100mm layer of solids of bulk density 2000 kg/m^3 at the walls. What should be the thickness of the walls of the basket if the perforations are so small that they have a negligible effect on strength. Density of phosphor bronze = 8900 kg/m^3 Maximum safe stress for phosphor-bronze = 55 MN/m^2 . 8
11. a) Derive the Langmuir and Freundlich equation for adsorption isotherm. 6
- b) Discuss the characteristics of good adsorbents and their application on commercial level. 7

OR

12. a) Explain the BET isotherm. 6
- b) Discuss the break through curve in adsorption. 7
